

Half Moon Bay Terrace Groundwater Basin

Groundwater Basin Number: 2-22

County: San Mateo

Surface Area: 9,200 acres (14 square miles)

Basin Boundaries and Hydrology

The Half Moon Bay Terrace Groundwater Basin is located along the northern San Mateo coast about 20 miles south of San Francisco and 90 miles southeast of the Sacramento Valley. The Terrace is bounded by Martini Creek on the north, by the Pacific Ocean on the west, by Tunitas Creek on the south, and by the base of Montara Mountain on the east. Elevations within the basin range from sea-level at the ocean to nearly 300 feet along the eastern boundary. Many creeks flow through the basin toward the Pacific Ocean. The primary creeks are Montara, San Vicente, Denniston, Pilarcitos, Purisima, and Lobitos.

The median annual precipitation in the subbasin is 24 – 28 inches, increasing from east to west.

Hydrogeologic Information

Water Bearing Formations

The basin area is underlain by Montara Mountain granite. Montara Mountain granite is part of a much larger Cretaceous-age magmatic arc complex known as the Salinian Block. The basin occupies a structural trough (a down dropped area between two faults) which has been filled with sediments transported from the adjacent hills (DWR, 1999). The alluvial materials consist of sandy clay, clayey and silty sand, and relatively clean coarse to fine sand. The generally silty to clayey nature of the sands present in the basin, along with the limited extent and thickness of the sandy aquifers present, generally limits the ability of the alluvial fill materials that constitute this basin to transmit and store groundwater (Luhdorff & Scalmanini, 1987).

Cretaceous Montara Mountain Granitic Rock. The granitic rock of Montara Mountain is a highly fractured medium to coarsely-crystalline rock. Exposures of the rock are commonly fractured and are commonly weathered to a depth of 100 feet. The granitic rock forms the mountain directly east of the coastline and underlies all of the younger geologic formations (DWR, 1999).

Pliocene Purisima Formation. The Purisima Formation is a highly fractured, well-indurated, soft to medium-hard, fossiliferous mudstone, siltstone, and sandstone. The formation rests nonconformably on

top of Montara Mountain granitics and is believed be hundreds of feet thick. The Purisima Formation crops out in the study area just west of Half Moon Bay Airport, and underlies most of the upper Pleistocene marine terrace deposits (DWR, 1999).

Pleistocene Marine Terrace Deposits. Marine terrace deposits are found along the coastline of the basin. The deposits consist of poorly to moderately consolidated marine, eolian, and alluvial sand, silt, gravel and clay. The formation lies unconformably on top of the Purisima Formation (USGS, 1961).

Holocene Coarse-Grained Alluvium. Coarse-grained alluvium consists of unconsolidated, moderately sorted sand and gravel. In the basin, coarse-grained alluvium is present in stream floodplains and as a fan deposit east of Half Moon Bay Airport (DWR, 1999).

Groundwater Level Trends

Hydrographs created from DWR well data in the north part of the basin have been stable. The depths to groundwater fluctuate annually to meet high demand periods. The depth to groundwater is generally greatest in summer months and shallowest in winter months. The overall groundwater level trend during the period of record has been upward.

Groundwater Storage

A previous study estimated groundwater storage in the Half Moon Bay Terrace basin. The 1987 study by Earth Sciences Associates and Luhdorff and Scalmanini Consulting Engineers estimated the usable groundwater in storage for the Half Moon Bay Airport and Pillar Point Marsh area to be about 1,300 acre-feet. This area is bounded by San Vicente Creek on the north, the community of El Granada on the south, the Seal Cove Fault on the west and Montara Mountain on the east.

Groundwater Storage Capacity. No published groundwater storage capacity data for the basin was found.

Groundwater in Storage. No published groundwater in storage data for the basin was found.

Groundwater Quality

Characterization. Water quality information for the Half Moon Bay Terrace is limited. However, Montgomery Watson (1996) indicated that much of the groundwater in the Northern part of the basin is high in iron and manganese and may require treatment prior to delivery. Title 22 total dissolved solids indicate a range of 160 to 460mg/l and an average of 283 mg/l for 12 wells.

Groundwater Budget (Type C)

Due to lack of groundwater budget data, inflows, including natural, applied, and artificial recharge and outflows including urban and agricultural extraction have not been included.

Well Production Characteristics

Well Yields: (gal/min)	Municipal/Irrigation: Range:		
Production Depths: (ft)	Total depths of completed wells		
	Domestic: Range: 30 – 600	Average: 137	(based on 579 wells)
	Municipal/Irrigation: Range: 40 - 140	Average: 93	(based on 18 wells)

Active Monitoring Data

Agency	Parameter	Number of Wells /Measurement Frequency
DWR	Groundwater levels	5 wells semi annual
	Miscellaneous water quality	4 wells biennially
Department of Health Services and cooperators	Title 22 water quality	9 wells

Basin Management

Groundwater Management:	None identified
Water Agencies: Public	Citizens Utilities Company of California
Private	Coastsude County Water District

References Cited

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